

Objections in the specification:

1) "Attempts to add to disclosure that pressure cylinders 215 provide container sealing in addition to closure (see P.4, line 2 of marked up copy) not supported by original disclosure and therefore raises the question of new matter."

Applicant's response:

See P2 original disclosure line 30:

"Is supported which in operation is stationary and sealed at the periphery by vertically moveable dependent rim portions 3"

And P4, lines 16-20:

"Fig. 3 is a sectioned drawing showing an improved method for ensuring that the dependent rims 3 when they take the form of peripheral, integral sides of the container 5 are actuated in the horizontal orientation when raised and lowered and that the full thrust of the fluid driven pistons in cylinders 215 is exerted when sealing the chamber against the horizontal pervious base 2."

2) "Applicant's attempt to change the disclosure that "A sample of filtrate flows through a turbidity meter 410" to "Simultaneously, filtrate flows through a turbidity meter 410" (Page 5, line 18 of the "marked-up" copy) does not appear to be supported by the original disclosure, and therefore raises the question of new matter."

Applicant's response:

Adding the word "simultaneously" can't be considered as new matter. This is backed up by Fig. 4 of the original disclosure where clearly the filtrate forced from the chamber 5 by compressed gas must simultaneously pass through 410 which is located in the filtrate conduit itself.

3) "Applicant's attempt to change the disclosure that "Cake drying" occurs in step 18 to "Gas continues to flow through the filter cake" (page 6, line 1 of the "marked up" copy does not appear to be supported by the original disclosure, and therefore raises the question of new matter."

Applicant's response:

Page 3, lines 14-15 of original disclosure:

"and external gas is fed through conduit 23 to container 5 whereby the residual liquid in the chamber and bed is removed."

The term "drying" is commonly used in filtration circles for the partial removal of liquid in filter cakes by passing gas through them. The word "drying" is mainly used loosely and for those not versed in the jargon of the technology it is often thought to mean "the drying action on matter by means of the application of heat". To avoid misunderstanding it is preferable to describe exactly what is meant by "drying" in the present specification. No new matter is being added in doing so. On page 3, lines 14-15, by feeding gas into the chamber and through the cake, the only interpretation is that the residual liquid in the cake is removed

by pressure differential and/or by entrainment. Another way of concisely putting this is that "gas continues to flow through the filter cake".

Naturally, if this gas were blown through the cake long enough under appropriate humidity conditions the cake would eventually be "dried". But this is not what is meant in the present invention, where one of the main objectives is to put the filter back on stream with as little delay as possible.

I hope this clarifies the matter.

Objections in the Claims:

1) "Applicant's attempt to present currently pending claim 1, in its entirety, as amended Claim 3 is improper and confusing. If the applicant desires to merely eliminate the limitations of Claims 3, then Claim 3 should be cancelled and Claim 1 left unchanged."

Claim 3 is now cancelled and Claims 1 and 2 are left unchanged.

2) "Similarly, Applicant's attempt to present currently pending claim 2 as amended claim 4 is improper and confusing".

Pending Claim 2 (as of office action 3 March, 2001):

"Liquid filtering apparatus according to Claim 1, thereby characterised, that means are provided to discharge the bed to a bed regeneration device (6), where the bed material is cleaned or cleaned and reactivated and recycled to the turbid liquid chamber (5) of the filtering apparatus (1) for reuse."

Amended Claim 4 (as of office action 3 March, 2001):

"A liquid purification system according to Claim 3, "once amended", whereby means are provided for **dosing** the cleaned and regenerated grains to the said contaminant chamber or to the feed of liquid to be purified during the purification operation."

Applicant's response:

The substance of this claim differs significantly from pending Claim 2 (as of office action 3 March, 2001).

The concept of **dosing** the material of the bed during the purification process has far reaching innovative consequences compared with the traditional method of performing a static bed.

Claim 4 in this form has been retained now dependent on Claim 2.

2. (continued):

"Furthermore, the bracketed portions of "twice amended" Claim 4 do (should?) not appear in currently pending Claim 4".

Applicant's response:

Correct. The bracketed portion of pending Claim 4 (as of office action 10 March, 2002 concerning marked up version of claims) could have been deleted but to prevent confusion (the applicant's) it was retained.
(See enclosed corrected marked-up and clean versions)

2. (continued):

"Currently pending Claim 4 recites "Liquid filtering apparatus according to Claim 2 or 3, whereby means are provided in the form of a conically perforated distributor 27 that extends over the entire internal cross-section of the turbid liquid chamber 5. See the amendment filed November 20, 2001."

Applicant's response:

Referred to here appears to be the filed "CLEAN" version of amendments (as of office action 10 March 2002).

There does not appear to be an objection pertaining to this "CLEAN" version. This appears as Claim 9 "once amended" in the current marked up version

2. (continued):

"Moreover, as in claim 4, the proposed deletions for claims 6,9,14,16 do (should ?) not appear in the current pending versions of these claims (see amendment filed November 20, 2001 for claims 6,9: and original claims 14,16).

Applicant's response:

This has now been put right (see enclosed corrected marked-up and clean versions).

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Claims

1. "twice amended"

Liquid filtering apparatus in the form of an open or closed vessel containing deep, static beds of coarse granular material such as sand acting as filter medium supported on a porous floor that divides the vessel into an upper turbid liquid chamber with an inlet nozzle or connection and an upper outlet or connection for the removal of bed back-washing liquid and a lower filtrate chamber with a back-washing liquid inlet nozzle and a filtrate outlet nozzle, whereby an operation to remove suspended solids the turbid liquid is preferably passed from top to bottom through the bed after which, and before repeating the cycle, clean liquid such as filtrate is passed through the bed from bottom to top to remove the solids trapped in the bed which leave the container as a suspension through a top outlet nozzle or connection, [thereby characterized that] whereby the container (1) with an upper turbid liquid feed conduit (12) and a lower filtrate outlet conduit (16) is divided in the vicinity of the pervious horizontal base (2) in such a way that a dependent rim portion(s) (3) of the upper turbid liquid chamber (5) is movable to facilitate the discharge of the bed from the container.

2. "twice amended"

Liquid filtering apparatus according to Claim 1, [thereby characterized, that] whereby means are provided to discharge the bed to a bed regeneration device (8), where the bed material is cleaned or cleaned and reactivated and recycled to the turbid liquid chamber (5) of the filtering apparatus (1) for reuse.

3 Cancelled

4. "twice amended"

A liquid purification system according to [Claim 1] Claim 2, whereby means are provided for dosing the cleaned and regenerated grains to the said [contaminant] turbid liquid chamber or to the feed of liquid to be purified during the purification operation.

5. Cancelled

6. "twice amended"

A liquid purification apparatus according to [Claim 1] Claim 4 "twice amended", whereby means are provided to dose pre-mixed or separately dose cleaned and regenerated grains of the bed with the powdered adsorbent materials to the said contaminant filter chamber or the feed of liquid to be purified during the purification process.

7. Cancelled

8. Cancelled

9. "once amended"

Liquid filtering apparatus according to [anyone of Claims 1-6] Claim 4 "twice amended" or Claim 6 "twice amended", whereby means are provided in the form of a conically perforated distributor (27) that extends over the entire internal cross-section of the turbid liquid chamber (5).



10. Cancelled

11. Cancelled

12. "once amended"

In a travelling web, flat bed filter apparatus that functions intermittently and in the stationary, sealed position receives contaminated liquid in a horizontal upper chamber and delivers filtered liquid from a lower filtrate chamber having a section of filter web or medium lying on and supported by a horizontal, fixed, pervious support plate or fixed drainage plate; cover means with dependent rim sections extending downwards, the lower surfaces of which make direct sealing engagement with peripheral portions of said section of filter medium or web, thus forming an upper contaminant chamber; a receptacle for filtered liquid located beneath the support plate having upstanding rim portions or a drainage plate with extended rim portions, whereby the upper surfaces of said rim portions make sealing engagement with the lower peripheral portions of the section of the filter medium or web, thus forming a lower filtrate chamber or drainage space; means for engaging and disengaging the said sealing surfaces of the upper cover and lower receptacle or recess, thus sealing and releasing respectively the said portions of the filter web; either a pressure pump located in a conduit in fluid connection with the means of contaminant supply and the interior of the upper contaminant chamber, combined with a liquid pressure pump the inlet of which is in liquid communication with the interior of the said receptacle for filtered liquid; or a suction/vacuum pump located directly in a conduit in fluid connection with the interior of the lower filtrate chamber or drainage space or indirectly through a filtrate receiver with a conduit in fluid communication with the interior of the lower filtrate chamber or drainage space; each of said pump configurations providing the means for transporting both contaminated and filtered liquid thereby creating and maintaining a pressure difference between the contaminant and filtrate chambers or drainage space; conduit means in fluid communication with a source of compressed gas and/or the surrounding atmosphere and the interior of the upper contaminant chamber; means for controlling the filtration operation consisting of liquid level and pressure switches connected to the filter chambers set to switch at maximum and/or minimum values, whereby said liquid level switches control the means for interrupting and initiating fluid flow in the gas conduits and the pressure switches are employed for interrupting or initiating the flow in the said liquid and gas conduits; transport means in engagement with the filter web to transport it over the said support plate consisting of a belt conveyor connected on both sides with chain and drive sprockets, whereby sections of the band are used as support for discrete strips of prefabricated filter media from storage means pre-cut to appropriate length and then introduced to the interior of the turbid liquid chamber (5) to coincide with the pervious horizontal base (2) and sealed at the periphery by the dependent rim portion(s) (3) of the said chamber.

13. Cancelled

14. "twice amended"

Liquid purifying apparatus according to [any one of Claims 4-6]
Claim 4 "twice amended" or Claim 6 "twice amended", whereby the dosing devices are controlled by a microprocessor (15) from input signals from feed and filtrate instrumentation (13,14).

15. "once amended"

In a travelling web, flat bed filter apparatus that functions intermittently and in the stationary, sealed position receives contaminated liquid in a horizontal upper chamber and delivers filtered liquid from a lower filtrate chamber having a section of filter web or medium lying on and supported by a horizontal, fixed, pervious support plate or fixed drainage plate; cover means with dependent rim sections extending downwards, the lower surfaces of which make direct sealing engagement with peripheral portions of said section of filter medium or web, thus forming an upper contaminant chamber; a receptacle for filtered liquid located beneath the support plate having upstanding rim portions or a drainage plate with extended rim portions, whereby the upper surfaces of said rim portions make sealing engagement with the lower peripheral portions of the section of the filter medium or web, thus forming a lower filtrate chamber or drainage space; means for engaging and disengaging the said sealing surfaces of the upper cover and lower receptacle or recess, thus sealing and releasing respectively the said portions of the filter web; either a pressure pump located in a conduit in fluid connection with the means of contaminant supply and the interior of the upper contaminant chamber, combined with a liquid pressure pump the inlet of which is in liquid communication with the interior of the said receptacle for filtered liquid; or a suction/vacuum pump located directly in a conduit in fluid connection with the interior of the lower filtrate chamber or drainage space or indirectly through a filtrate receiver with a conduit in fluid communication with the interior of the lower filtrate chamber or drainage space; each of said pump configurations providing the means for transporting both contaminated and filtered liquid thereby creating and maintaining a pressure difference between the contaminant and filtrate chambers or drainage space; conduit means in fluid communication with a source of compressed gas and/or the surrounding atmosphere and the interior of the upper contaminant chamber; means for controlling the filtration operation consisting of liquid level and pressure switches connected to the filter chambers set to switch at maximum and/or minimum values, whereby said liquid level switches control the means for interrupting and initiating fluid flow in the gas conduits and the pressure switches are employed for interrupting or initiating the flow in the said liquid and gas conduits; transport means in engagement with the filter web to transport it over the said support plate consisting of a belt conveyor connected on both sides with chain and drive sprockets, whereby the improvement comprises means for determining and/or controlling the rate of filtration of a quantity of liquid contained in the contaminant chamber comprising a gas flow meter (406), gas throttling valve (407) and gas pressure meter (405) in the said conduit in fluid communication with a source of compressed gas and the interior of the upper contaminant chamber.

16. "twice amended"

Method of liquid purification control according to [Claim 12 or 15] Claim 6 or 8, whereby in conjunction with the determination of the quality of the turbid liquid and filtrate by the means (13, 14), single sheets of known filtration characteristics are employed for determining the filtration characteristics of turbid liquids of unknown filtration characteristics, whereby the sheets after these determinations are transported out of the filter chamber for deposition or whereby sections of the filter band of unknown filtration characteristics are transported onto the said pervious support plate or fixed drainage plate for determining the filtration characteristics with liquids of known filtration characteristics.

17. Cancelled**18. Cancelled****19. Cancelled****20. Cancelled**